SIM Medium (NCM0277)

Intended Use
SIM Medium is used for the differentiation of microorganisms on the basis of hydrogen sulfide production, indole production, and motility in a laboratory setting. SIM Medium is not intended for use in the diagnosis of disease or other conditions in humans.

Description
Semisolid media have been used extensively in the determination of bacterial motility. The production of hydrogen sulfide, indole formation, and motility are useful diagnostic tests in the identification of *Enterobacteriaceae*, especially *Salmonella* spp. and *Shigella* spp.

In 1940, Sulkin and Willett demonstrated motility, hydrogen sulfide production, and carbohydrate fermentation by members of *Salmonella* and *Shigella* groups. They called attention to the "brush-like growth" or motility of the typhoid organisms. Greene et al. used SIM Medium to detect motility in a large series of cultures of typhoid organisms.

Typical Formulation
Enzymatic Digest of Casein	20.0 g/L
Enzymatic Digest of Animal Tissue	6.1 g/L
Ferric Ammonium Citrate	0.2 g/L
Sodium Thiosulfate	0.2 g/L
Agar	3.5 g/L

Final pH: 7.3 ± 0.2 at 25°C
Formula may be adjusted and/or supplemented as required to meet performance specifications.

Precaution
Refer to SDS

Preparation
1. Suspend 30 g of the medium in one liter of purified water.
2. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
3. Autoclave at 121°C for 15 minutes.
4. Cool to 45-50°C.

Quality Control Specifications
Dehydrated Appearance: Powder is homogeneous, free flowing, and beige.

Prepared Appearance: Prepared medium is light amber and clear to slightly hazy.

Expected Cultural Response: Cultural response in SIM Medium at 35°C after 18 - 24 hours of incubation.

Microorganism	Approx. Inoculum (CFU)	Expected Results			
		Recovery	H_2S	Indole	Motility
Escherichia coli ATCC® 25922	2 – 3 colonies; direct inoculum	+	-	+	+
Salmonella typhimurium ATCC® 14028	2 – 3 colonies; direct inoculum	+	+	-	+
Shigella flexneri ATCC® 12022	2 – 3 colonies; direct inoculum	+	-	-	-

The organisms listed are the minimum that should be used for quality control testing.

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Test Procedure

1. Using a wire, inoculate test organism two-thirds into the medium with stab motion.
2. Incubate with loose caps at 35 ± 2°C for 18 – 24 hours.
3. Examine tubes after incubation for motility and H_2S production.
4. Add 3 – 4 drops of Kovac's Reagent to each tube. Record as indole positive if a pink or red color appear, or as indole negative if there is no color change. Add Kovac's Reagent after determining motility and H_2S production.

Results

Motility is indicated by turbidity of the medium or growth extending from inoculating stab line. H_2S production is shown by a blackening along the stab line. Indole production is seen as the production of a red color after the addition of Kovac's Reagent. Indole is produced from the tryptophane present in the medium.

Refer to appropriate references for complete identification of *Enterobacteriaceae*.

Expiration

Refer to expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Due to nutritional variation, some strains may grow poorly or fail to grow on this medium.
2. Avoid inoculum from liquid or broth suspension as growth initiation will be delayed.
3. Reactions are not sufficient to speciate organisms. Additional biochemical and serological tests are required for confirmation.

Storage

Store dehydrated culture media at 2-30°C away from direct sunlight. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

References

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